IOWA DEPARTMENT OF NATURAL RESOURCES

LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

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Stream Water Quality Summary 2000-2015

Water Quality Parameter	Units	Number of Samples	Min Value	Percentiles					Max Value
				10th	25th	50th	75th	90th	
Acetochlor [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	11
Alachlor [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2
Alkalinity, Total	mg/L	441	55	160	200	240	290	320	460
Ammonia (as N)	mg/L	14,165	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	5.7
Atrazine [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	0.60	53
Butylate	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	mg/L	456	18	57	67	80	99	120	150
Carbonaceous BOD (5 day)	mg/L	13,919	<2	<2	<2	<2	2	4	30
Chloride	mg/L	13,465	<1	11	16	21	29	40	180
Chlorophyll a [1]	mg/L	4,832	<1	<1	3	10	37	110	620
Chlorophyll b [1]	mg/L	4,828	<1	<1	<1	<1	<1	2	70
Chlorophyll c [1]	mg/L	4,787	<1	<1	<1	<1	2	9	66
Chlorophyll free of pheophytin	mg/L	9,292	<1	2	4	10	27	78	870
Corrected Chlorophyll a	mg/L	4,835	<1	2	5	13	43	123	640
Cyanazine [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.3
Deethylatrazine [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.54
Deisopropylatrazine [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	2.6
Dimethenamid [4]	mg/L	6,794	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	3.8
Diss. Orthophosphate (as P)	mg/L	14,111	<0.1	<0.1	<0.1	<0.1	0.15	0.28	9.5
Dissolved Oxygen	mg/L	13,562	0.7	7.7	8.8	10.6	12.9	14.4	21
E.coli Bacteria	CFU/100 ml	14,150	<10	<10	30	110	390	1,800	920,000
Field pH	pH units	14,284	5.0	7.8	8.0	8.2	8.4	8.5	10.9
Field Temperature	Celsius	14,338	0	0.1	1.8	12.0	20.3	24.3	34.3
Magnesium	mg/L	456	2.9	16	21	27	34	38	68
Metolachlor [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	0.30	23.00
Metribuzin [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.50
Nitrate+Nitrite (as N)	mg/L	14,345	<0.1	0.7	2.7	5.4	8.0	11	39
Organic Carbon	mg/L	6,441	<0.5	2.4	3.3	4.9	7.5	12	260
Pheophytin [1]	mg/L	4,828	<1	<1	1	3	8	18	204
Potassium	mg/L	455	<1	1.6	1.9	2.6	3.8	5.5	17
Silica [2]	mg/L	8,203	<1	4.9	8.9	13	17	21	190
Simazine [4]	mg/L	8,618	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.00
Sodium	mg/L	456	2.0	6.0	8.3	10	14	18	69
Specific Conductance [3]	µmhos/cm	8,374	120	420	510	620	720	830	1700
Sulfate	mg/L	13,167	<1	19	25	35	60	99	410
Total Dissolved Solids	mg/L	14,161	4	250	300	360	430	510	3,980
Total Hardness (as $CaCO_3$)	mg/L	13,938	3	200	240	300	360	410	820
Total Kjeldahl Nitrogen	mg/L	14,163	<0.1	0.27	0.49	0.70	1.2	1.8	28
Total Phosphorus	mg/L	14,160	<0.1	<0.1	0.11	0.19	0.32	0.54	26
Total Volatile Suspended Solids	mg/L	8,366	<1	1	3	7	16	30	2,100
Total Suspended Solids	mg/L	14,165	<1	3	9	32	81	200	17,000
Trifluralin [4]	mg/L	8,627	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.35
Turbidity	NTU	14,112	<1	2.5	5.4	16	38	89	8,500

µg/L - micrograms per liter; mg/L - milligrams per liter; NTU - Nephelometric Turbidity Units
CFU/100 ml - Colony Forming Units /100 milliliters of water; BOD - Biological Oxygen Demand

µmhos/cm - micromhos per centimeter; < - less than detection limit shown; Diss. - Dissolved
Raw data are available through IASTORET at https://programs.iowadnr.gov/iastoret/
Note: This summary differs from previous summaries in that it only includes monthly data for stream sites monitored as part of the DNR's monthly stream network. Previous summaries included monthly, event, and other available data for these sites. Additional stream sites throughout Iowa are also monitored but are not included in this summary since their sampling frequency and parameters vary from the fixed network.

[1] Sampling discontinued in 2005; [2] Sampling discontinued in 2008; [3] Sampling discontinued in 2009; [4] Sampling suspended from Sep 2008 through May 2012; sampling resumed May 2012 through July 2014

The number of stream sites sampled monthly during 2000 through 2015 varied from 58 to 84.

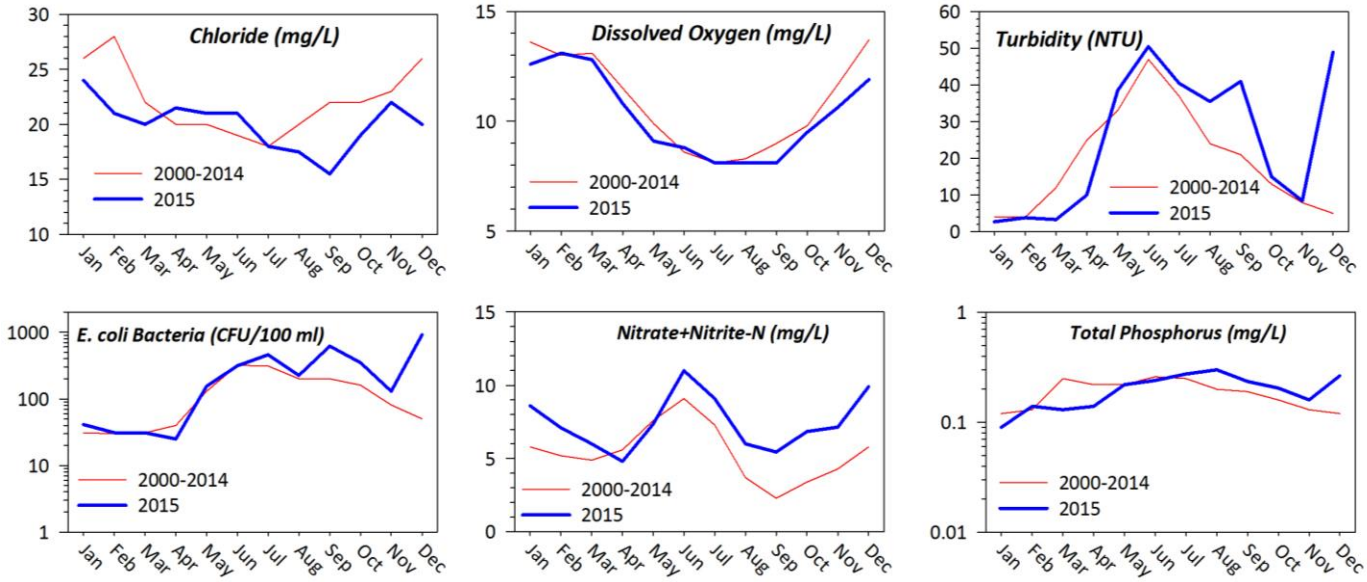

Figure 1. Monthly median concentrations for stream monitored statewide as part of the DNR's Ambient Stream Monitoring Program.

Monthly median stream concentrations for 2015 followed patterns similar to those seen from 2000 through 2014 (Figure 1). December 2015 was the wettest December among 143 years of record as 5.04 inches of rain fell during the month (3.70 inches above normal; State Climatologist, Iowa Department of Agriculture & Land Stewardship). The above normal rainfall for December resulted in a decline in chloride concentrations and an increase in *E. coli* bacteria, nitrate+nitrite-N, turbidity, and a slight increase in total phosphorus.

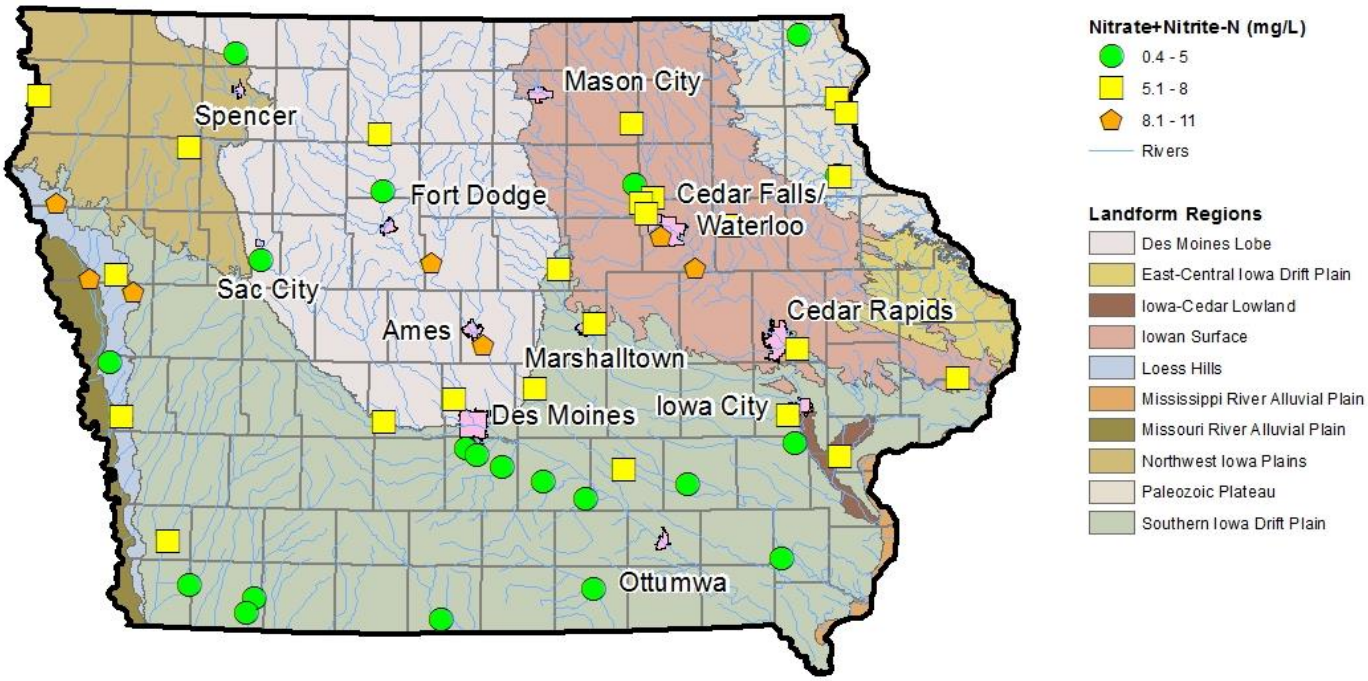

Figure 2. Median nitrate+nitrite-N concentrations for 52 stream sites monitored all years from 2000 through 2015 as part of the DNR's Ambient Stream Monitoring Program. Note: Other stream sites were monitored during those years but do not have 16 years of data.

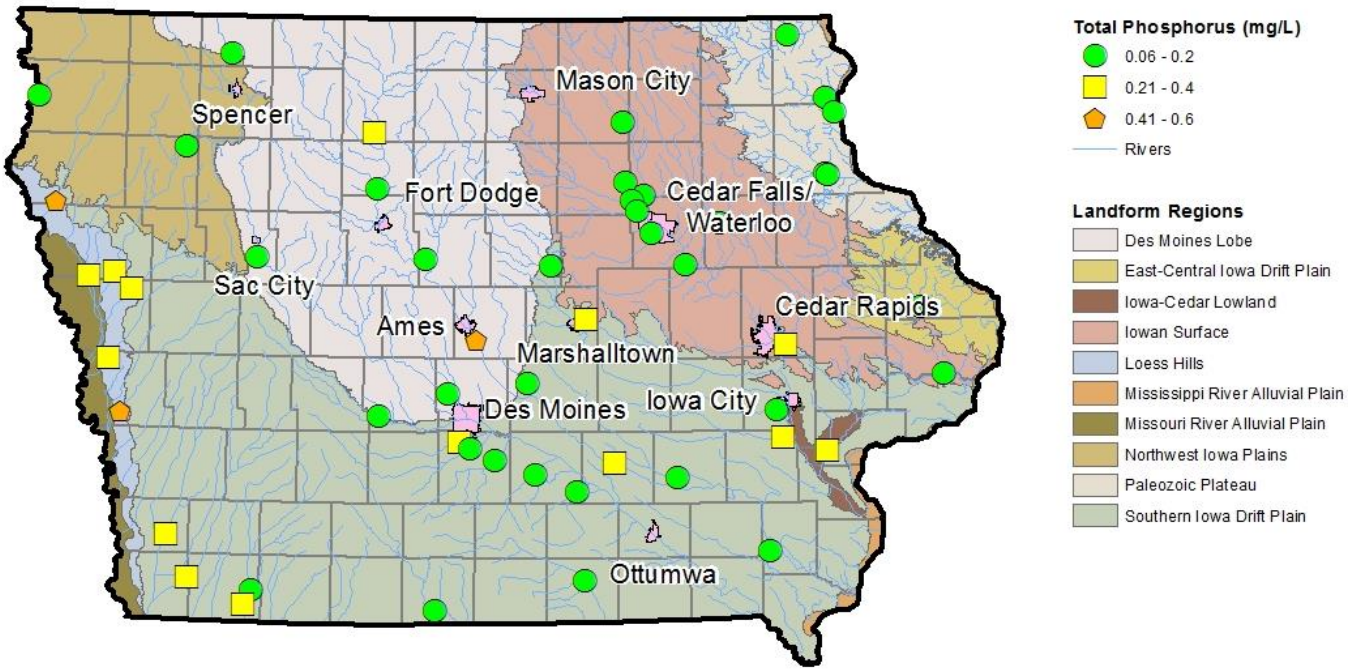

Figure 3. Median total phosphorus concentrations for the 52 stream sites monitored all years from 2000 through 2015 as part of the DNR's Ambient Stream Monitoring Program. Note: Other stream sites were monitored during those years but do not have 16 years of data.

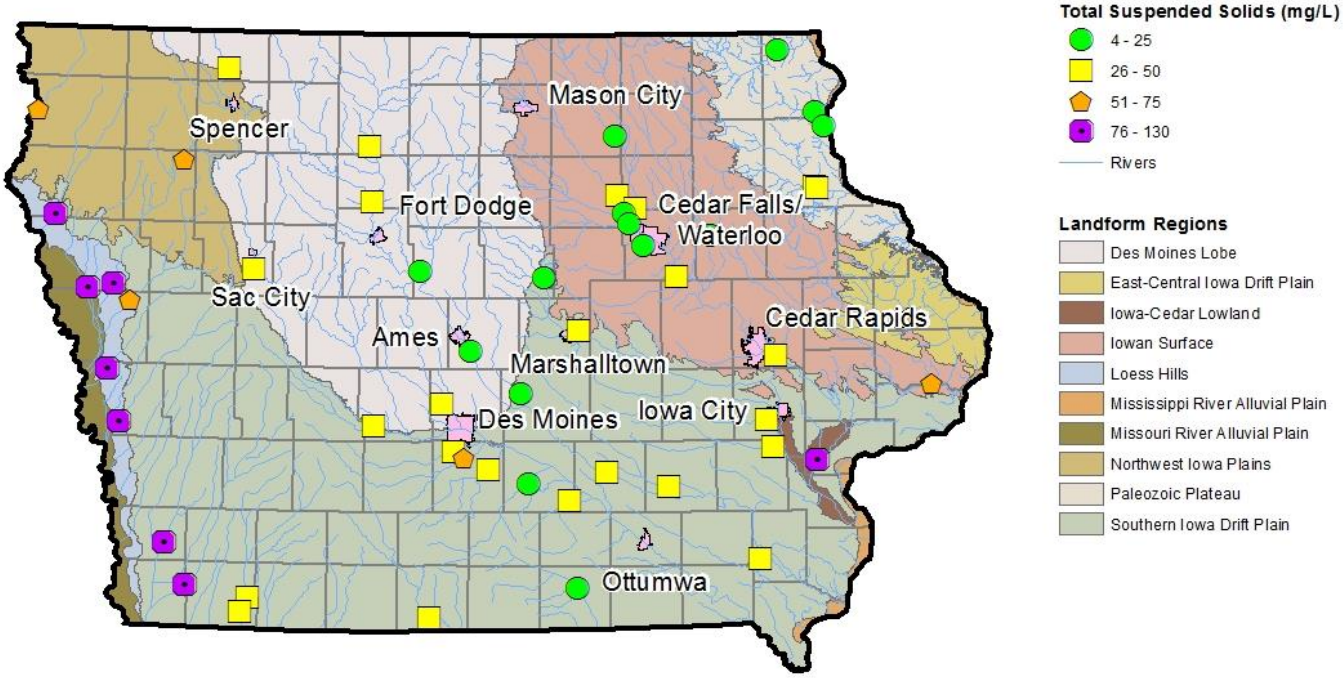

Figure 4. Median total suspended solids concentrations for the 52 stream sites monitored all years from 2000 through 2015 as part of the DNR's Ambient Stream Monitoring Program. Note: Other stream sites were monitored during those years but do not have 16 years of data.

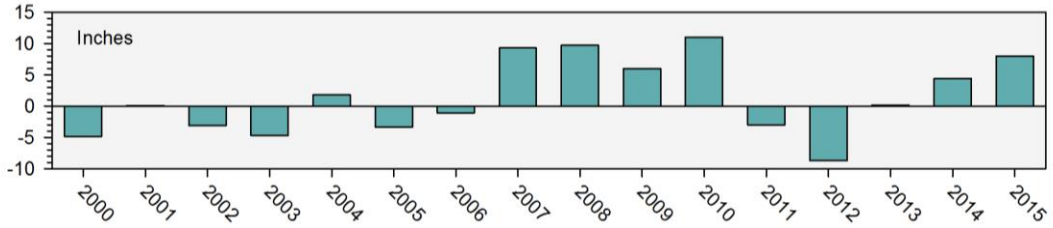

Figure5. Departure from long-term normal rainfall statewide for Iowa for 2000 through 2015. Source of rainfall data – Harry Hillaker, State Climatologist, Iowa Department of Agriculture & Land Stewardship.

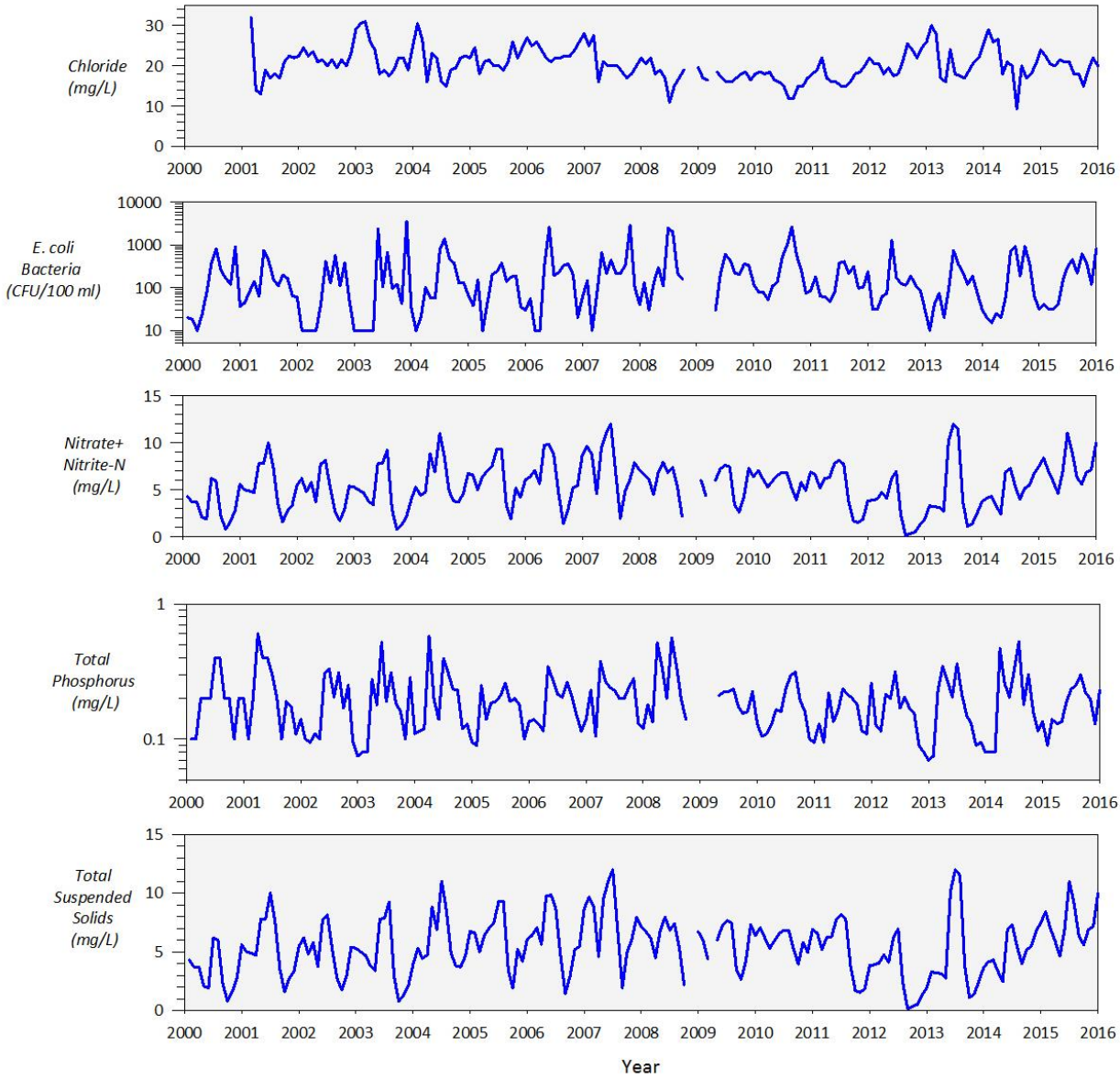

Figure 6. Median monthly concentrations for the 52 stream sites monitored all years from 2000 through 2015 as part of the DNR's Ambient Stream Monitoring Program. Note: Other stream sites have been monitored during those years but do not have 16 years of data.

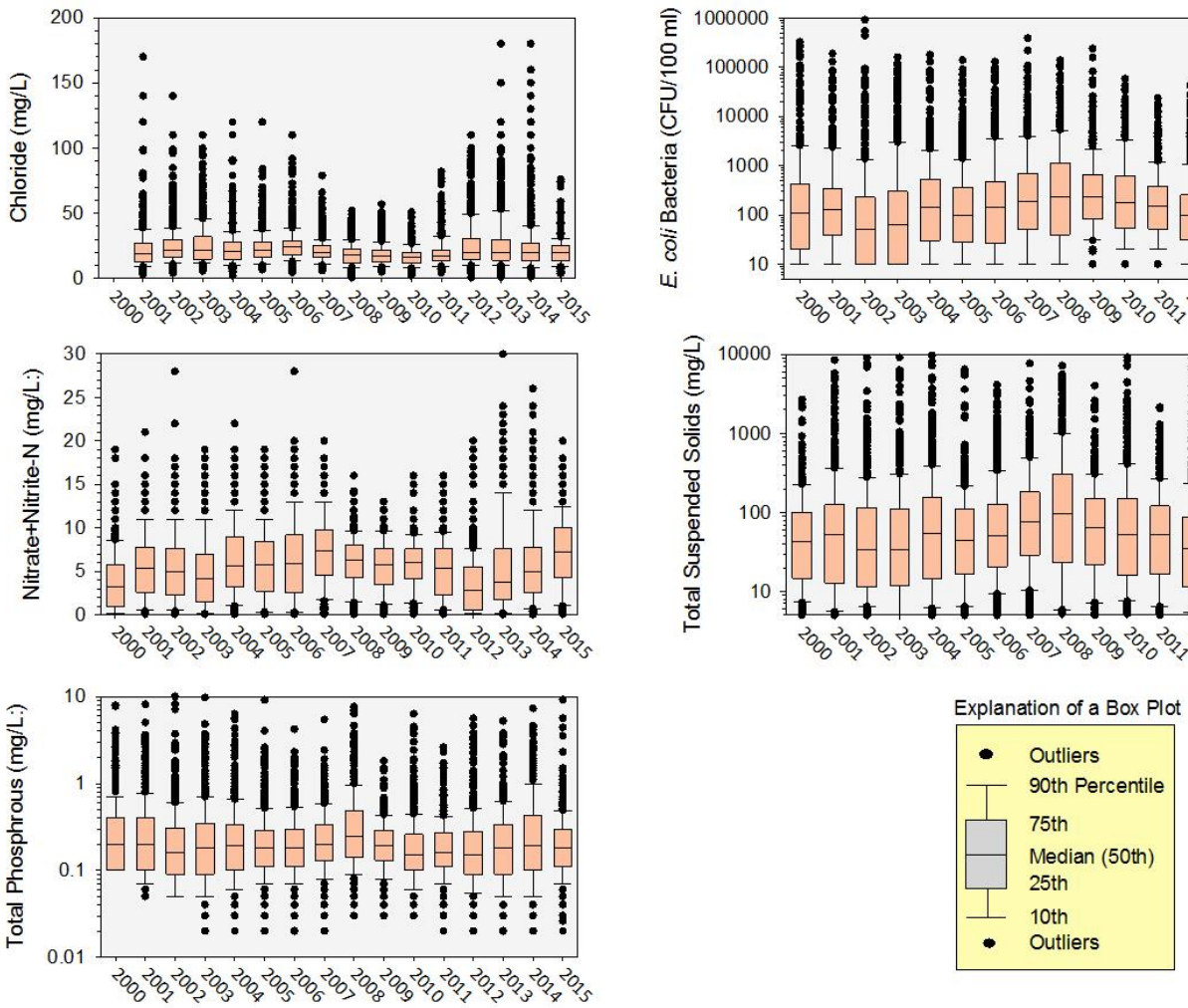

Figure7. Box plots by year of data from 52 stream sites monitored all years from 2000 through 2015 as part of the DNR's Ambient Stream Monitoring Program. Note: Other stream sites have been monitored during those years but do not have 16 years of data.

Figure 7 shows the variability in concentrations from year to year. Monitoring for chloride did not begin until 2001. Median chloride concentrations ranged from 16 to 22 mg/L; nitrate+nitrite-N from 2.8 to 7.3 mg/L; *E. coli* bacteria from 50 to 230 CFU/100 ml; total suspended solids from 34 to 96 mg/L; and total phosphorus from 0.15 to 0.25 mg/L. The drought year of 2012 resulted in lower concentrations overall for several of the parameters, including nitrate+nitrite-N, *E. coli* bacteria, total suspended solids, and total phosphorus.